129-2-6/10

TITLE: The Effect of Phosphorus and Manganese on the Temper Brittleness of Chromium-Nickel Steel. (Vliyaniye fosfora i margantsa na otpusknuyu khrupkost' khromonikelevoy stali).

boundaries of the austenitic range, by forming finely dispersed phosphides or by enrichment of the boundary zones. It is concluded that even in steels with a low content of Cr-Ni, P has a strong influence on the tendency to develop temper brittleness. The influence of P increases sharply with an increasing manganese content. Manganese increases rapidly the tendency of Cr-Ni steel to develop temper brittleness with high P contents (above 0.03%); with low P contents (below 0.01%) its influence is considerably weakened. Increase in the P content (0.01 to 0.3% or of the Mn content from 0.1-0.2 to 0.5-0.7%) increases the temperature range in which temper brittleness develops. Reduction of the contents of P and Mn in steel permits reduction of the tempering temperature during heat treatment and thereby to improve the combination of mechanical properties. Steel with a low content of P and Mn does not show a tendency to temper brittleness at ordinary testing temperatures; at reduced

Card 4/6

129-2-6/10

TITLE: The Effect of Phosphorus and Manganese on the Temper Brittleness of Chromium-Nickel Steel. (Vliyaniye fosfora i margantsa na otpusknuyu khrupkost' khromonikelevoy stali).

(below freezing point) test temperatures its tendency to temper brittleness does not exceed the temper brittleness of ordinary Cr-Ni-Mo steels. To save Mo it is advisable to establish a sliding scale related to the contents of Mo as a function of the P content. Aparently P participated directly in processes which cause the development to temper brittleness. This appears to be the case as a result of the effect of low P contents on the coarsening of steel, as a result of the dependence of Mo and Mn on the P content in the steel and as a result of the change in the temperature range of the brittleness as a function of the P content.

The text contains 4 tables, and 7 sets of graphs. There are 15 references, of which 10 are Slavic.

ASSOCIATION: Siberian Metallurgical Institute (Sibirskiy metallurgichesky institut)

Card 5/6

129-2-6/10

TITLE: The Effect of Phosphorus and Manganese on the Temper Brittleness of Chromium-Nickel Steel. (Vliyaniye fosfora i margantsa na otpusknuyu khrupkost' khromonikelevoy stale).

PRESENTED BY: ---

SUBMITTED: ---

AVAILABLE: Library of Congress

Card 6/6

SOV/137-58-8-16527

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 42 (USSR)

AUTHORS Levin, A.M., Kramarov, A.D.

TITLE: Smelting of Electrical Steel From Blooms Containing Ni (Opyt vyplavki elektrostali iz nikel'soderzhashchey kritsy)

PERIODICAL: Tr. Sibirsk. metallurg. in-ta, 1957, Nr 4, pp 142-157

ABSTRACT: A 10-ton basic arc furnace was employed for smelting four batches of Cr-Ni-Mo steel. Two batches were smelted in accordance with standard procedures, whereas the smelting of the other two batches was carried out with a charge containing 60 and 64% of blooms with the following composition: 82.5-86.8% Fe_{total}, 0.99-1.06% Ni, 0.19-0.38% Cr, 1.65-1.86% C, 0.09-0.12% S, and 0.17-0.22% P. The nonmetallic components of the blooms amounted to approximately 20% and contained up to 45% SiO_2. The technology of experimental smeltings differed from the standard procedures in the following respects a) introduction of 200-400 kg of lime and 100 kg of Fe ore into the charge, b) addition of 500 kg of lime and 150-200 kg of ore during the melting stage, c) discharging the slag twice during the melting stage; d) a P content of 0.067 and 0.116% after fusion.

Card 1/2

Smelting of Electrical Steel From Blooms Containing Ni

e) introduction of an oxidizing slag in amounts equivalent to 41.7 and 36.9%; f) a reduction in Mn content to 0.02% at the end of the boil stage; g) a reduction in S content to values of 0.064 and 0.073% after fusion, and 0.031 and 0.029% prior to the beginning of the finishing stage; h) reduction in Ni consumption by 5 kg/t of steel and an increase in the consumption of Fe-Mn by 8 kg/t of steel; i) increase in the time required for smelting of 1 ton of metal, under current from 37 to 46 minutes; j) a 30-35% increase in consumption of electrical energy coupled with a reduction in output of liquid metal from 95 to 80%. The finished metal of the experimental smeltings was characterized by an increased P content and a reduced concentration of gases and nonmetallic inclusions. As evidenced by macro inspection, susceptibility to flakes, mechanical properties of longitudinal and transverse specimens at normal and reduced temperatures, by anisotropy and temper-brittleness tendencies, the metal produced in experimental smeltings does not differ from metal obtained by standard smelting methods.

A.Sh.

1. Steel alloys--Production 2. Electric furnaces--Performance
3. Steel alloys--Properties 4. Nickel--Metallurgical effects

KRAMAROV, A.D.

SOV/137-58-8-16472

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 34 (USSR)

AUTHORS: Zotkin, I.A., Kramarov, A.D.

TITLE: An Investigation of Causes of Friability of Ferrosilicon (Issledovaniye prichin rassypayemosti ferrosilitsiya)

PERIODICAL: Tr. Sibirsk. metallurg. in-ta, 1957, Nr 4, pp 208-214

ABSTRACT: Investigations were carried out in order to establish how the friability of Fe-Si preserved in air or water is affected by various contents of Si, Al, and P. It is established that alloys containing 55-65% Si exhibit greatest tendency toward friability; the Al affects this tendency only when the Si content is greater or smaller than indicated above; Al also increases the friability of alloys at reduced concentrations of P. In laboratory conditions, regardless of the content of Si and Al, specimens of alloys did not crumble when the P content amounted to less than 0.06%; shop specimens, however, did not crumble only if the P content was less than 0.03% and their friability increased with increasing P content. An attempt to preserve alloys with friable tendencies under water resulted in a considerable increase in the rate of their disintegration; however,

Card 1/2

SOV/137-58-8-16472

An Investigation of Causes of Friability of Ferrosilicon

alloys possessing no such tendencies in air did not disintegrate in water either. Shielding the alloys from air immediately after casting by means of H_2, vacuum, or paraffin protected them from crumbling regardless of their Si and P content. Gases which evolved during the first stage of the interaction between the alloys and water were composed of 35-65% H_2 and 30-60% PH_3, whereas the gases produced in the second stage consisted almost entirely of H_2. Bibliography: 3 references.

A.Sh.

1. Iron-silicon alloys--Physical properties 2. Silicon--Metallurgical effects
3. Aluminum--Metallurgical effects 4. Phosphorus--Metallurgical effects
5. Air--Metallurgical effects

Card 2/2

SOV/137-58-9-18557

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 54 (USSR)

AUTHORS: Zotkin, I. A., Kramarov, A. D.

TITLE: Liquation of Silicon and its Effect on the Friability of Ingots of 75%-Ferrosilicon (Likvatsiya kremniya i yeye vliyaniye na rassypayemost' slitkov 75%-nogo ferrosilitsiya)

PERIODICAL: Tr. Sibirsk. metallurg. in-ta, 1957, Nr 4, pp 215-221

ABSTRACT: The effect of the thickness of 75%-Fe-Si ingots (I) on the degree of liquation of Si contained in them was investigated, together with the effect of the liquation of Si on the friability of the I. During casting of four-step I in lined molds it was established that the liquation of Si, which in this case manifests itself by the fact that the upper portions of the I are richer in this element, increases with increasing thickness of the I and attains significant proportions when the thickness is greater than 100 mm; as a result thereof, the Si content in the lower portion of the I is reduced to 60-68%. I with such Si content and with a P content varying from 0.03% to 0.04%, whether stored in the open air or in an enclosed dry area, disintegrated within one month after casting, whereas I less than 100 mm

Card 1/2

Liquation of Silicon and its Effect (cont.)

thick did not crumble. When I were cast into cast-iron molds, the degree of liquation of Si contained in the I was reduced and the nature of the process was altered, the maximum content of Si being observed in the upper and lower regions of the I, whereas the central region exhibited a minimum amount of Si. In this instance only I with a thickness greater than 170 mm were observed to disintegrate. Bibliography: 4 references.

A. Sh.

1. Iron silicon alloys--Casting 2. Silicon (Liquid)--Metallurgical effects

Card 2/2

KRAMAROV, A.D.

DUBROV, N.F., kand. tekhn. nauk; MIKHAYLOV, O.A., kand. tekhn. nauk; FEL'DMAN, I.A.; DANILOV, A.M.; SOROKIN, P.Ya., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; BUTAKOV, D.K., kand. tekhn. nauk, dots.; SOYFER, V.M.; LATASH, Yu.V., mladshiy nauchnyy sotrudnik; ZAMOTAYEV, S.P.; BEYTEL'MAN, A.I.; SAPKO, A.I.; PETUKHOV, G.K., kand. tekhn. nauk; YEDNERAL, F.P., kand. tekhn. nauk, dots.; LAPOTYSHKIN, N.M., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; ROZIN, R.M.; NOVIK, L.M., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; LAVRENT'YEV, B.A.; SHILYAYEV, B.A.; SHUTKIN, N.I.; GNUCHEV, S.A., kand. tekhn. nauk, starshiy nauchnyy sotrudnik; LYUDEMAN, K.F., doktor-inzh., prof.; GHUZIN, V.G., kand. tekhn. nauk; BARIN, S.Ya.; POLYAKOV, A.Yu., kand. tekhn. nauk; FEDCHENKO, A.I.; AGEYEV, P.Ya., prof., doktor; SAMARIN, A.M.; BOKSHITSKIY, Ya.M., kand. tekhn. nauk; GARNYK, G.A., kand. tekhn. nauk; MARKARYANTS, A.A., kand. tekhn. nauk; KRAMAROV, A.D., prof., doktor tekhn. nauk; TEDER, L.I.; DANILOV, P.M.

Discussions. Biul. TSNIICHM no.18/19:69-105 '57. (MIRA 11:4)

1. Direktor Ural'skogo instituta chernykh metallov (for Dubrov). 2. Direktor TSentral'nogo instituta informatsii chernoy metallurgii (for Mikhaylov). 3. Nachal'nik nauchno-issledovatel'skogo otdela osobogo konstruktorskogo byuro tresta "Elektropech'" (for Fel'dman). 4. Nachal'nik martenovskoy laboratorii Zlatoustovskogo metallurgicheskogo zavoda (for Danilov, A.M.). 5. Laboratoriya protsessov stalevareniya Instituta metallurgii Ural'skogo filiala AN SSSR (for Sorokin).

(Continued on next card)

DUBROV, N.F.---(continued) Card 2.
6. Ural'skiy politekhnicheskiy institut (for Butakov). 7. Starshiy inzhener Bryanskogo mashinostroitel'nogo zavoda (for Soyfer). 8. Institut elektrosvarki im. Patona AN URSR (for Latash). 9. Nachal'nik TSentral'noy zavodskoy laboratorii "Uralmashzavoda" (for Zamotayev). 10. Dnepropetrovskiy metallurgicheskiy institut (for Sapko). 11. Moskovskiy institut stali (for Yedneral). 12. TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (for Gmuchev, Lapotyshkin). 13. Starshiy master Leningradskogo zavoda im. Kirova (for Rozin). 14. Institut metallurgii im. Baykova AN SSSR (for Novik, Polyakov, Garnyk). 15. Nachal'nik tekhnicheskogo otdela zavoda "Bol'shevik" (for Lavrent'yev). 16. Starshiy inzhener tekhnicheskogo otdela Glavspetsstali Ministerstva chernoy metallurgii (for Shilyayev). 17. Zamestitel' nachal'nika tekhnicheskogo otdela zavoda "Elektrostal'" (for Shutkin). 18. Freybergskaya gornaya akademiya, Germanskaya Demokraticheskaya Respublika (for Lyudeman). 19. Zaveduyushchiy laboratoriyey stal'nogo lit'va TSentral'nogo nauchno-issledovatel'skogo instituta tekhnologii i mashinostroyeniya (for Gruzin). 20. Starshiy master elektrostaleplavil'nykh pechey Uralvagonzavoda (for Barin). 21. Zamestitel' nachal'nika elektrostaleplavil'nogo tsekha zavoda "Sibelektrostal'" (for Fedchenko). 22. Zaveduyushchiy kafedroy metallurgii stali i elektrometallurgii chernykh metallov Leningradskogo politekhnicheskogo instituta (for Ageyev). 23. Zamestitel' direktora Instituta metallurgii im. Baykova AN SSSR, chlen-korrespondent AN SSSR (for Samarin).

(Continued on next card)

DUBROV, N.F.---(continued) Card 3.

24. Nachal'nik laboratorii TSentral'nogo nauchno-issledovatel'skogo instituta chernoy metallurgii (for Bokshitskiy). 25. Zaveduyushchiy kafedroy elektrometallurgii Sibirskogo metallurgicheskogo instituta (for Kramarov). 26. Nachal'nik elektrostaleplavil'nogo tsekha Kuznetskogo metallurgicheskogo kombinata (for Teder). 27. Nachal'nik elektrometallurgicheskoy laboratorii Kuznetskogo metallurgicheskogo kombinata (for Danilov, P.M.).

(Steel--Metallurgy)

18(5) PHASE I BOOK EXPLOITATION SOV/1371

Kramarov, Abram Davidovich

Proizvodstvo stali v elektropechakh (Making Steel in Electric Furnaces) Moscow, Metallurgizdat, 1958. 439 p. 6,800 copies printed.

Ed.: Miller, A.I.; Ed. of Publishing House: Lebedev, A.I.; Tech. Ed.: Islent'yeva, P.G.

PURPOSE: This is a textbook for students of ferrous metallurgy attending metallurgical and polytechnic institutes. It may also be useful to engineers and technicians in the metallurgical industry.

COVERAGE: The book is divided into two parts, one concerned with the phyico-chemical processes of electric-steel production and the other with the basic technological principles of such production. The author gives the following information: In 1956 there were

Card 1/ 15

Making Steel in Electric Furnaces SOV/1371

659 electric furnaces in operation in the USSR providing an overall capacity of 2,186 metric tons. In 1955 some 3,412,000 tons of electric steel were produced. During the period 1956-60 it is planned to increase production of electric steel by 79 percent. Acknowledgements are made to the following personalities for help in reviewing the manuscript: N.M. Chuyko, Professor, Doctor of Technical Sciences; Yu. A. Shul'te, Professor, Doctor of Technical Sciences; A.M. Levin, Docent, Candidate of Technical Sciences; L. Ya. Liberman; N.V. Tolstoguzov; A.V. Vishnyakov; and the engineers A.I. Miller, A.I. Lebedev, V.P Timerman, L.I. Teder, A.N.Glazov, V. Ya. Monastyrskiy, P.M. Danilov, A.D. Chernenko, Ye. N. Shirinkin, and N.N. Krasnoryadtsev. There are 218 references, of which 158 are Soviet, 42 German, and 18 English.

TABLE OF CONTENTS:

Card 2/ 15

SOV/137-58-9-19963

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 268 (USSR)

AUTHORS: Tolstoguzov, N.V., Kramarov, A.D.

TITLE: On the Nature of Failure in Brittle Steel (O kharaktere razrusheniya khrupkoy stali)

PERIODICAL: V sb.: Metallovedeniye i term. obrabotka. Moscow, Metallurgizdat, 1958, pp 112-121

ABSTRACT: A study is made of the effect of temper brittleness upon the nature of failure of Cr-Ni steel of the following percentage composition: C 0.30-0.43, Cr 1.3-1.5, Ni 2.8-3.34. Etching of fractures for 5 minutes in saturated picric-acid-in-ether solution makes it possible to distinguish differences in grain boundary structure in the brittle and the ductile states. Study of the etchability of the grain and the nature of failure in the specimens showed temper brittleness to be induced by processes occurring on the boundaries of what had been the austenite grain. When temper brittleness has developed, fracture occurs along the grain boundaries, whereas in the ductile condition it is in the grain. 1. Chromium-nickel steel--Failure 2. Hardness--Metallurgical effects 3. Grains (Metallurgy)--Structural analysis F.U. 4. Austenite--Properties

Card 1/1

SOV/137-58-9-18620

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 9, p 65 (USSR)

AUTHORS: Levin, A.M., Kramarov, A.D.

TITLE: The Minimum Silicon-carbon Ratio in Killed Steel (O minimal'nom sootnoshenii mezhdu soderzhaniyem kremniya i ugleroda v spokoynoy stali)

PERIODICAL: V sb.: Staleplavil'n. proiz-vo. Moscow, Metallurgizdat, 1958, pp 3-10

ABSTRACT: A theoretical analysis shows that the minimum amount of Si needed to deoxidize steel depends upon its C contents: When C rises from 0 to 0.1% it increases from 0 to 0.08%; when the C content is 0.1-0.16%, 0.08% Si is required, while with 0.16-0.30% C the Si requirement is 0.08-0.23%, and with 1.4-4.3% C the amount of residual Si diminishes from 0.23 to hundredths of a per cent. To verify the theoretical conclusions, experiments are conducted on the deoxidation of carbon steels of various compositions melted in an 80-kg electric furnace with 180-kva transformer. 130 experimental ingots of 2.2 kg weight were investigated and confirmed the theoretical principles established. The experimental and theoretical curves of ratio of ingot

Card 1/2

SOV/137-58-9-18620

The Minimum Silicon-carbon Ratio in Killed Steel

density to C and Si contents are similar in quality and in good quantitative agreement.

L.K.

1. Steel--Processing 2. Carbon--Theory 3. Silicon--Theory 4. Steel--Test results

Card 2/2

KRAMAROV A.D.

PHASE I BOOK EXPLOITATION SOV/4380

Zavod imeni Dzerzhinskogo, Dneprodzerzhinsk

Metallurgi v bor'be za tekhnicheskiy progress (Metallurgists in the Fight for Technical Progress) [Moscow] Izd-vo VTsSPS Profizdat 1959 56 p. 3,000 copies printed.

Special Eds.: Ye. V. Kochinev, F.M. Novikova, and I.B. Polyak; Ed.: E.A. Makarova; Tech. Ed.: N.D. Shadrina.

PURPOSE: This book is intended for technical personnel interested in metallurgical processes.

COVERAGE: The book contains 9 articles dealing with technical improvements developed and implemented by members at the Plant imeni Dzerzhinskiy, Dneprodzerzhinsk, of the Nauchno-tekhnicheskoye obshchestvo chernoy metallurgii (Scientific and Technical Society for Ferrous Metallurgy). Individual articles discuss techniques in limestone kilning, blast-furnace charges, intensification of open-hearth processes, ingot rolling, and improvements in rail production.

Card 1/3

Metallurgists in the Fight for Technical Progress SOV/4380

No personalities are mentioned. There are no references.

TABLE OF CONTENTS:

AVAILABLE: Library of Congress (TN705.Z3)

Card 3/3

AC/dwm/mas
11-15-60

KRAMAROV, A.D.; TOLSTOGUZOV, N.V.; ZARVIN, Ye.Ya.; TIMMERMAN, V.P.; LEVIN, A.M.; GUROV, A.K.

Making manganese alloys from Usa deposit manganese ores. Izv. vys. ucheb. zav.; chern. met. no.12:46-54 '60. (MIRA 14:1)

1. Sibirskiy metallurgicheskiy institut.
(Usa Valley--Manganese ores)
(Manganese alloys--Metallurgy)

ZARVIN, Ye.Ya.; KRAMAROV, A.D.; TOLSTOGUZOV, N.V.; GUROV, A.K.; LEVIN, A.M.; TIMMERMAN, V.P.

Use of silicomanganese made of Usa ores for the reduction of steel. Izv. vys. ucheb. zav.; chern. met. no.12:55-62 '60. (MIRA 14:1)

1. Sibirskiy metallurgicheskiy institut.
(Usa Valley--Ore deposits)
(Silicon manganese alloys)

DANILOV, P.M.; KRAMAROV, A.D.; YEREMENKO, S.N.; GLAZKOVA, L.V.

Oxygen content and nonmetallic inclusions in steel with its deoxidation by aluminum. Izv. vys. ucheb. zav.; chern. met. 4 no.8:48-55 '61. (MIRA 14:9)

1. Kuznetskiy metallurgicheskiy kombinat i Sibirskiy metallurgicheskiy institut.
(Steel--Oxygen content) (Aluminum)

EDNERAL, Fedor Prokop'yevich; FILIPPOV, Anatoliy Fedorovich; KRAMAROV, A.D., prof., doktor tekhn. nauk, retsenzent; TOLSTOGUZOV, N.V., dots., kand. tekhn. nauk, retsenzent; LEVIN, A.M., retsenzent; VISHNYAKOV, A.V., retsenzent; KATS, L.N., retsenzent; SHVEDOV, L.V., red.; ROZENTSVEYG, Ya.D., red. izd-va; MIKHAYLOVA, V.V., tekhn. red.

[Calculations on the electrometallurgy of steel and ferroalloys]Raschety po elektrometallurgii stali i ferrosplavov. Izd.2., ispr. i dop. Moskva, Metallurgizdat, 1962. 230 p. (MIRA 15:12)

(Steel--Electrometallurgy)
(Iron alloys--Electrometallurgy)

KRAMAROV, Abram Davidovich, prof., doktor tekhn. nauk

[Steelmaking in electric furnaces] Proizvodstvo stali v elektropechakh. 2., perer. izd. Moskva, Metallurgiia, 1964. 440 p. (MIRA 17:9)

КРАМАРОВ В.П.

AUTHORS: Fedorov, L.I., and Kramarov, B.P. (Moscow) 47-4-20/20

TITLE: New Devices of the GLAVUChTEKhPROM (Noyye pribory Glavuchtekh-proma)

PERIODICAL: Fizika v shkole, 1957, No 4, pp 93-96 (USSR)

ABSTRACT: The article contains particulars about some new devices manufact-
ed for instructional purposes by various enterprises. The
Plant for Manufacturing School Appliances (Zavod shkol'nogo
priborostroyeniya) at Zagorsk is producing a telescope-refract-
or for use in the 10th class of secondary schools, and higher
and in secondary pedagogical institutions teaching astronomy.
The telescope consists of the following principal parts (Fig-
ure 1): tube with lens, ocular tube with a pull-out mech-
anism, and an equatorial accessory. The objective and the
oculars are made of optical glass K-8 (Chrome yellow - 8), Ф-1
(flint glass -1) and БК-6 (barium chromate). The article
supplies further data. The Factory "Elektropribor", Moscow,
manufactures voltage regulators РНШ-56 and РНШ-55 (Figures
3 and 4). They differ favorably from other transformers and
autotransformers in so far as they enable a smooth regulation
of voltage, starting from 0 to 250 v by 1.5 - 2 v. The max-
imum capacity is 2 kw for РНШ-55 and 0.44 kw for РНШ-56 .

Card 1/2

New Devices of the GLAVUChTEKhPROM

47-4-20/20

The article gives additional particulars. The Plant "Elektrodelo", Leningrad, has started to issue radio engineering devices: detector receivers, amplifiers for low frequency, electro-dynamic loudspeakers in a socket, and demonstration lamp panels. They are intended to supplement sets consisting of an ultra-short wave generator, resonance circuit, and a receiving dipole antenna. Further particulars may be seen in the article. In order to demonstrate dying and continuous oscillations in a circuit consisting of capacitance and self-induction, the "Elektrodelo" Plant has produced a condenser battery made of paper condensers of the type КБТ-МН with a capacitance of 0.5 - 2 microfarad, and a general capacitance of 58 microfarad (Figure 7). By means of an ordinary switch, combinations of condensers may be composed with the following capacitance: 0.5; 1.0; 1.5; 4.0; 8.0; 16.0; 32.0 and 58.0 microfarad. The article contains 5 figures and 2 circuit diagrams.

AVAILABLE: Library of Congress

Card 2/2

Kramarov, B.P.

47-6-35/37

AUTHOR: Kramarov, B.P. (Moskva)

TITLE: New Devices of the Glavuchtekhprom (Novyye pribory Glavuchtekhproma)

PERIODICAL: Fizika v Shkole, 1957, # 6, pp 91 - 92 (USSR)

ABSTRACT: The article contains a brief description of a device for composing spectral colors, a jack for demonstrating the equality in the expenditure of work and the application of the screw in its construction, and a small selenium rectifier. For the rectifier a table of permissible loads is given at the end of the article. The aforementioned devices were developed at the "Glavuchtekhprom".

AVAILABLE: Library of Congress

Card 1/1

AUTHOR: Kramarov, B.P. (Moscow) 47-58-2-28/30

TITLE: New Devices of GLAVUCHTEKHPROM (Novyye pribory GLAVUCHTEKHPROMA) Wave Tank with a Vibrator (Volnovaya vanna s vibratorom)

PERIODICAL: Fizika v Shkole, 1958, Nr 2, pp 93-94 (USSR)

ABSTRACT: This is a description of a vat built by the GLAVUCHTEKHPROM for the study of wave-formation and spreading. The device consists of a metallic vat with a glass bottom and a vibrator with a number of different nozzles that can be fixed on the vibrator. The vibrator, fixed on the rim of the vat, produces various waves that are illuminated by a tube placed under the vat. A screen is placed in one corner above the vat (Figure 3) and pupils can observe wave formation and spreading on this screen. There are 3 figures.

AVAILABLE: Library of Congress

Card 1/1 1. Water waves-Study and teaching

SOV-47-58-5-11/28

AUTHOR: Kramarov, B.P., Chief of Technical Section

TITLE: The Use of Plastic Materials at the Glavuchtekhprom Enterprises(Primeneniye plasticheskikh mass na predpriyatiyakh Glavuchtekhproma)

PERIODICAL: Fizika v shkole, 1958, Nr 5, pp 57-59 (USSR)

ABSTRACT: The author gives a review of the production of plastic training aids by Glavuchtekhprom plants, such as the Shchelkovskiy zavod imeni Dzerzhinskogo (Shchelkovo Plant imeni Dzerzhinskiy), the Plant "Fizelektropribor" in Moscow and other enterprises. He points out that after having received hydraulic presses with a pressure capacity of 60-100 tons and having carried out mechanization, the plants are now in a position to manufacture not only small but also large items from plastics and other materials, in particular from thermoplastic and the refuse of caprone fibers. The plants of Glavuchtekhprom are now manufacturing over 250 different items, totalling 5,000,000 units per year.
There are 4 photos.

Card 1/2

SOV-47-58-5-11/28

The Use of Plastic Materials at the Glavuchtekhprom Enterprises

ASSOCIATION: Glavuchtekhprom

1. Training devices--Production 2. Plastics--Applications

Card 2/2

KRAMAROV, B.P.

For an increase in school supplies and equipment. Fiz. v shkole 20 no.6:103 N-D '60. (MIRA 14:2)

1. Nachal'nik Tekhnicheskogo otdela Glauchtekhproma Ministerstva prosveshcheniya RSFSR.
(Schools—Furniture, equipment, etc.)

KRAMAROV, B. P.

From the Administration of the Technical Education Aids Industry. Fiz. v shkole 22 no.4:110 Jl-Ag '62. (MIRA 15:10)

1. Nachal'nik tekhnicheskogo otdela Glavnogo upravleniya predpriyatiyami uchebno-tekhnicheskoy promyshlennosti.

(Physics—Audio-visual aids)

KRAMAROV, B.P.

New apparatus. Fiz. v shkole 23 no.3:64-67 My-Je '63.
(MIRA 16:12)

1. Nachal'nik tekhnicheskogo otdela Glavnogo upravleniya predpriyatiy uchebno-tekhnicheskoy promyshlennosti Ministerstva prosveshcheniya RSFSR.

KRAMAROV, B.P.

New instruments. Fiz. v shkole 23 no.5:62-68 S-O '63.
(MIRA 17:1)

1. Nachal'nik tekhnicheskogo otdela Glavnogo upravleniya predpriyatiyami uchebno-tekhnicheskoy promyshlennosti Ministerstva prosveshcheniya RSFSR.

KRAMAROV, B.Ya.

Electromagnetic device for setting the cutters of the cutter head. Der.prom. 8 no.12:26 D '59. (MIRA 13:5)

1. Rostovskaya na-Donu fabrika klavishnykh instrumentov.
(Woodworking machinery)

BOROVITSKIY, Pavel Illarionovich; VINNICHENKO, Pavel Fedorovich; KRAMAROV, Dmitriy Yakovlevich; TULYAKOVA, Glafira Mikhaylovna; YAKOVLEVA, Ol'ga Sergeyevna; GERD, S.V., redaktor; KIRNARSKAYA, A.A., tekhnicheskiy redaktor

[Methods of teaching natural history] Metodika prepodavaniia estestvoznaniia. Pod obshchei red. P.I.Borovitskogo. Leningrad, Gos. uchebno-pedagog. izd-vo Ministerstva prosveshcheniia RSFSR, Leningradskoe otd-nie, 1955. 607 p. (MLRA 8:6)
(Natural history--Study and teaching)

BOROVITSKIY, Pavel Illarionovich; VINNICHENKO, Pavel Fedorovich; KRAMAROV, Dmitriy Yakovlevich; TULYAKOVA, Glafira Mikhaylovna; YAKOVLEVA, Ol'ga Sergeyevna; KUZNETSOV, P.A., red.; KAPYSHEVA, V.S., red. izd-va; MURASHOVA, V.A., tekhn. red.

[Methods of teaching biology] Metodika prepodavaniia biologii. Izd.2., perer. Moskva, Vysshaia shkola, 1962. 335 p. (MIRA 15:7)
(Biology--Study and teaching)

KRAMAROV, E.

Book on the role of transportation in Soviet foreign trade.
Vnesh. torg. 43 no.1:52-53 '64. (MIRA 17:2)

KRAMAROV, Efraim Menakhimovich; KARAMZIN, Ye.V., red.; KRUGLOVA, Ye.M., red. izd-va; LAVRENOVA, N.B., tekhn. red.

[Regular shipping lines in capitalist countries] Morskoe lineinoe sudokhodstvo kapitalisticheskikh stran. Moskva, Izd-vo "Morskoi transport," 1961. 215 p. (MIRA 14:10)
(Merchant marine)

KRAMAROV, Grigoriy Moiseyevich; SOKOLOV, O., red.

[At the dawn of astronautics; on the occasion of the 40th anniversary of the founding of the first Society of Interplanetary Communications in the world] Na zare kosmonavtiki; k 40-letiiu osnovaniia pervogo v mire Obshchestva mezhplanetnykh soobshchenii. Moskva, Znanie, 1965. 94 p. (MIRA 18:7)

KRAMAROV, Grigoriy Moiseyevich; IVANITSKIY, V.Yu., red.; RAKITIN, I.T., tekhn. red.

[The first Society of Astronautics in the world]Pervoe v mire obshchestvo kosmonavtiki. Moskva, Izd-vo "Znanie," 1962. 31 p. (Novoe v zhizni, nauke, tekhnike. IX Seriia: Fizika i khimiia, no.15) (MIRA 15:8)
(Astronautics--Societies, etc.)

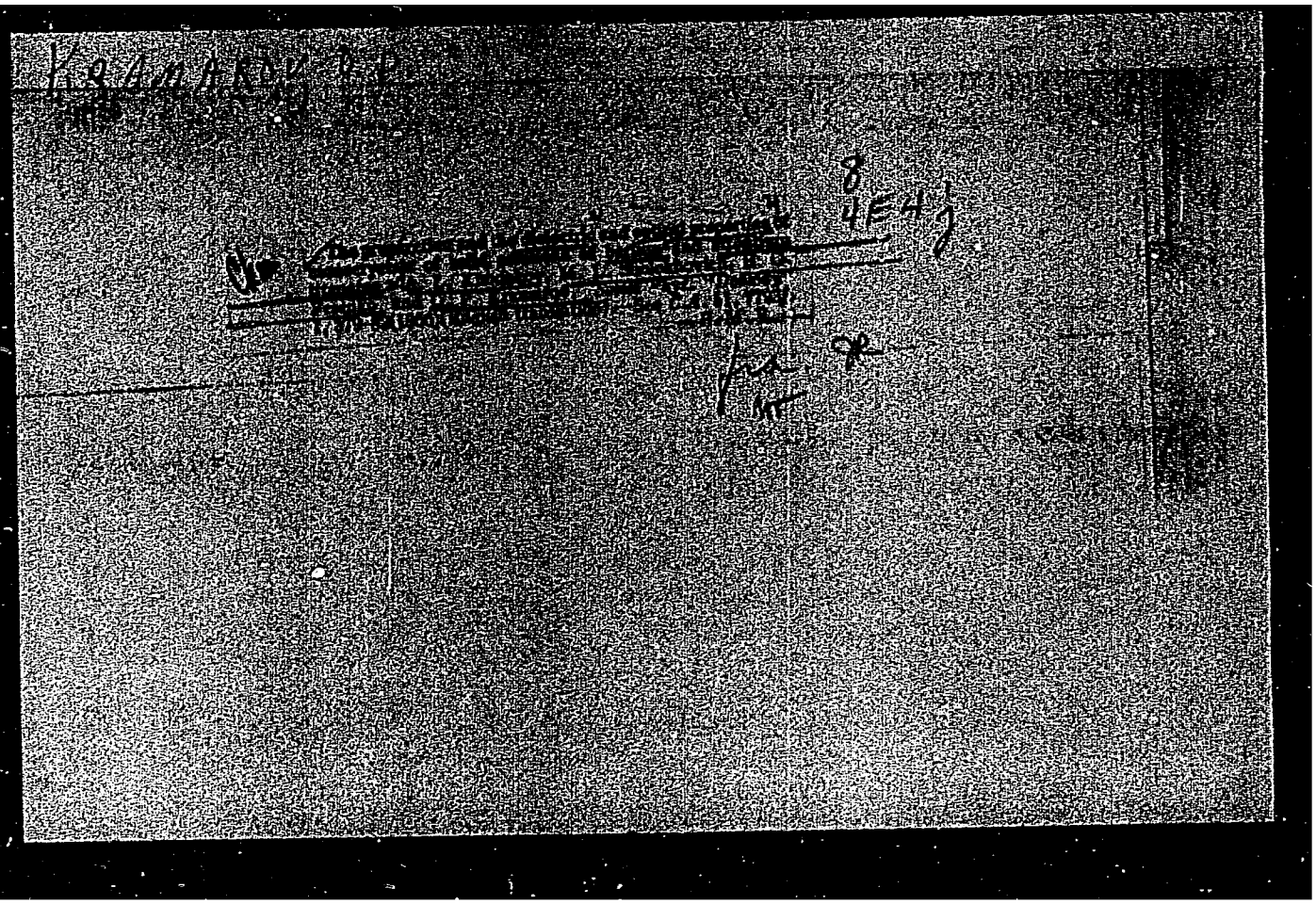
KRAMAROV, G.M.

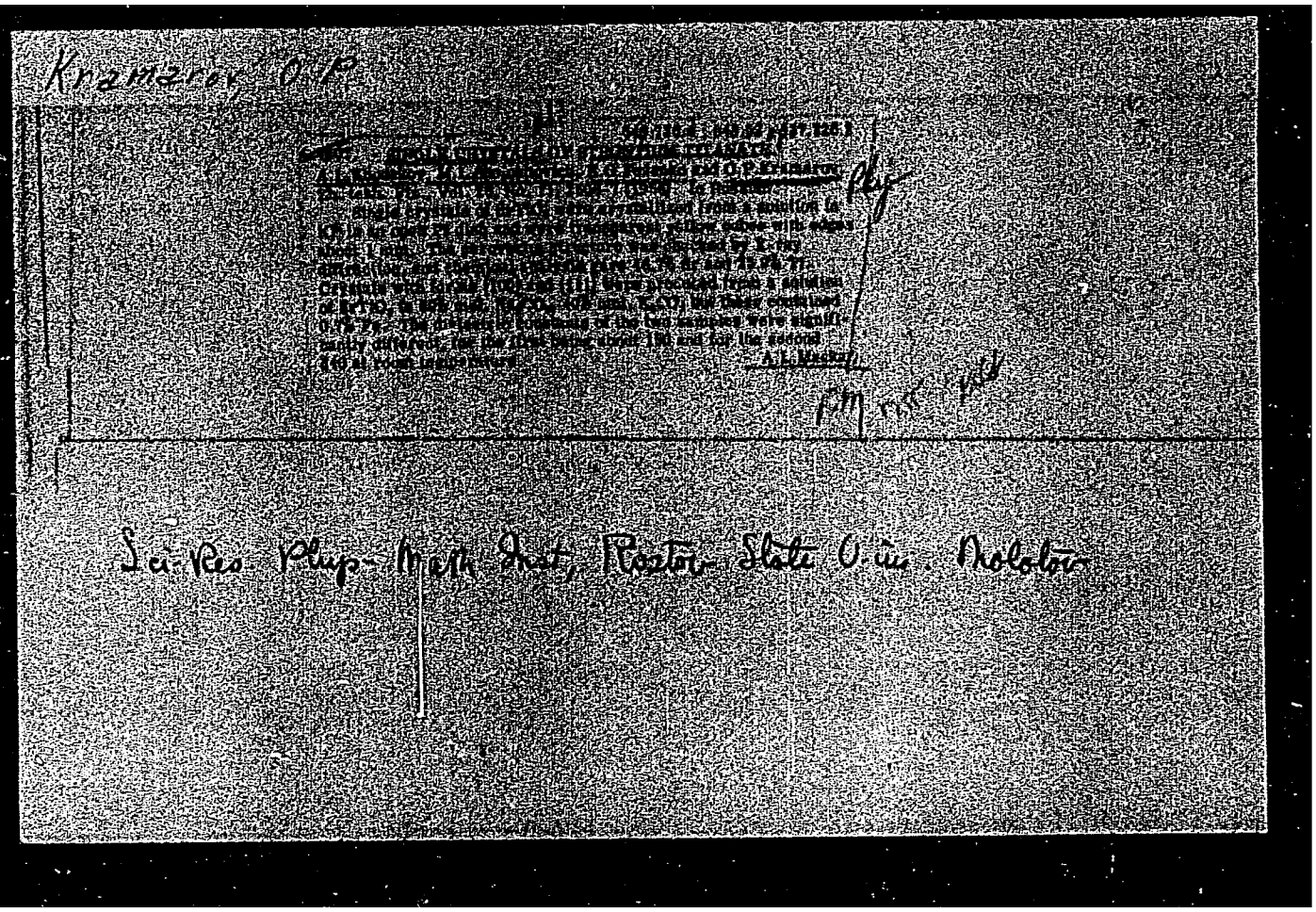
Society for studying interplanetary voyages. Trudy Inst.ist.est. i tekh. 45:107-114 '62. (MIRA 15:8)
(Space flight)

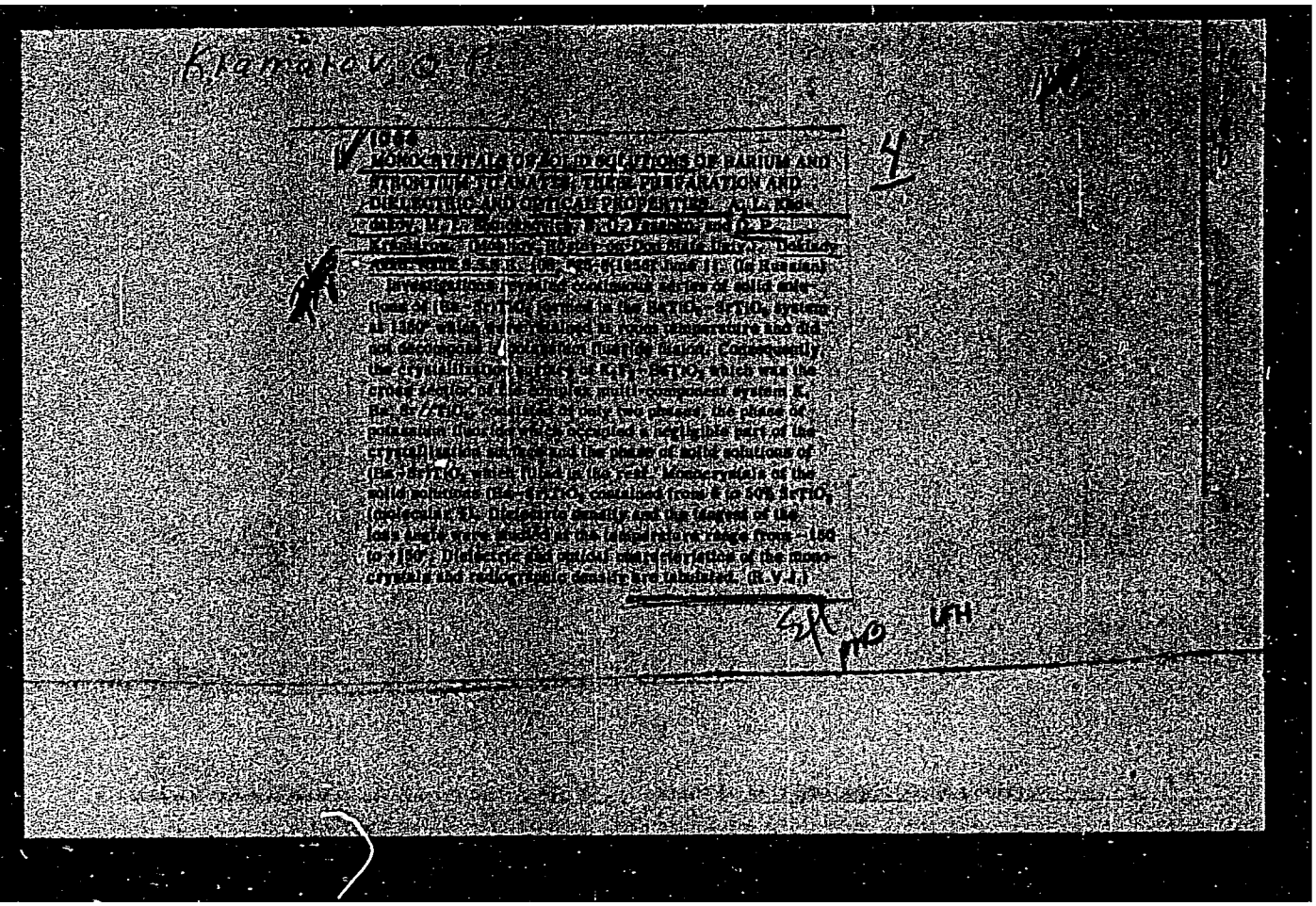
KRAMAROV, G.P., (Stalingrad).

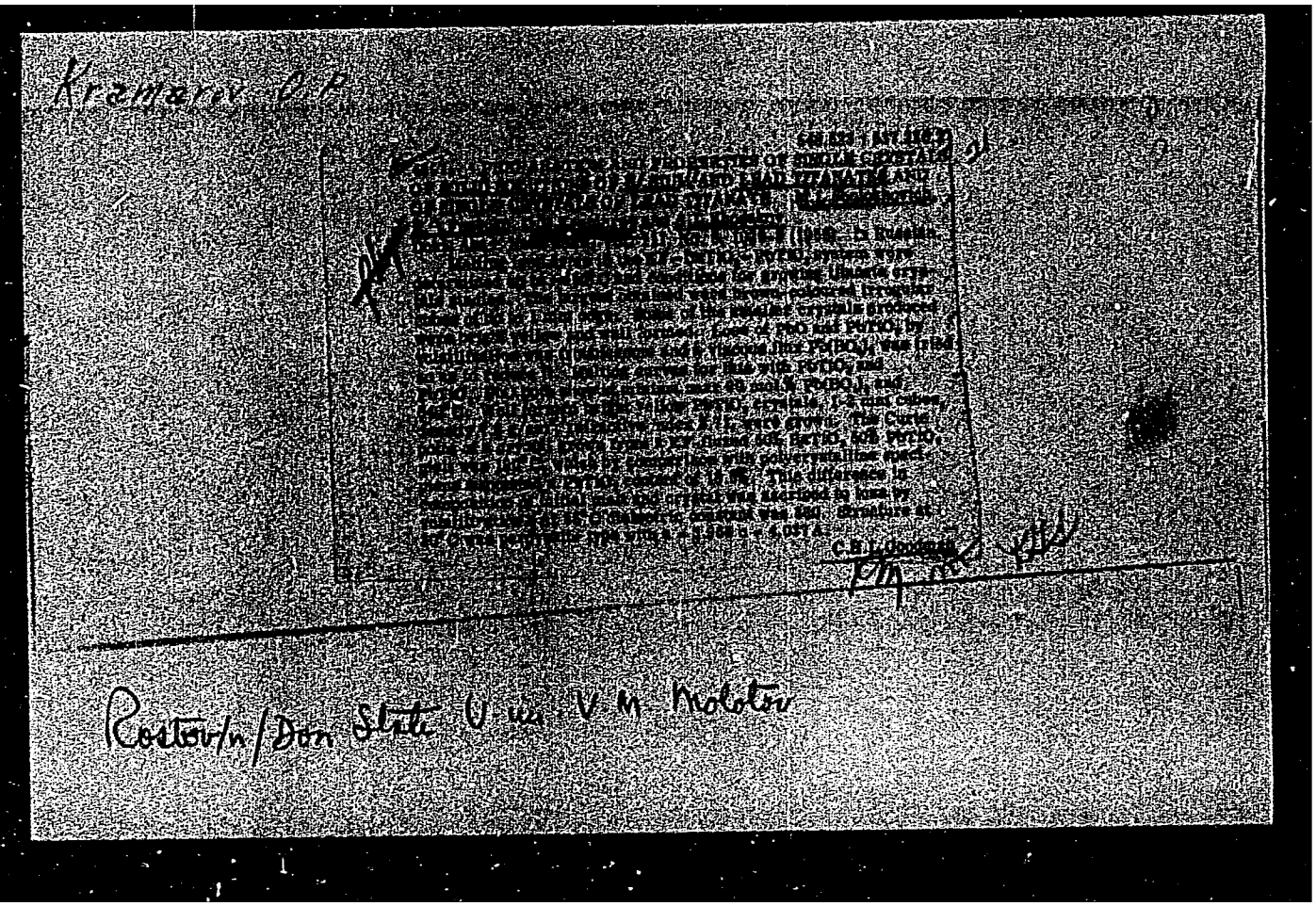
Increasing the metering limits of uniform scale ohmmeters.
Radio no.10:59 '56. (MLRA 9:11)

(Ohmmeters)









KRAMAROV, O.P.

SUBJECT: USSR/Luminescence 48-3-1/26

AUTHORS: Novosil'tsev, N.S., Khodakov, A.L., Sholokhovich, M.L., Fesenko, Ye.G. and Kramarov, O.P.

TITLE: The Cultivation and Investigation of Ferroelectric Monocrystals (Vyrashchivaniye i issledovaniye monokristallov segneto-elektrikov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya fizicheskaya, 1957, Vol 21, #3, pp 295-304 (USSR)

ABSTRACT: The Scientific Research Physico-Mathematical Institute at the ROSTOV/DON State University has studied the interaction of barium titanate, strontium titanate, lead titanate and lead zirconate with a series of substances in the molten state. A number of suitable salty solvents for the above mentioned substances and crystallization conditions have been established.

Several methods for cultivating crystals of barium and strontium titanates and zirconates were applied:

a. Monocrystals of $BaTiO_3$ and $SrTiO_3$ were obtained out of a molten mixture of sodium and potassium carbonates and polycrystallic barium and strontium titanates. These monocrystals

Card 1/4

TITLE: The Cultivation and Investigation of Ferroelectric Monocrystals (Vyrashchivaniye i issledovaniye monokristallov segneto-elektrikov)

were obtained out of a molten mixture of potassium fluoride and respective titanates.

b. Monocrystals of the lead zirconate were obtained out of a molten mixture of potassium fluoride with polycrystallic lead zirconate.

Three different consignments of barium titanate crystals were grown. They differed in the value of c/a ratio. The Curie point of these crystals was at temperatures of 50°,80° and 110°C.

During the careful studies of $BaTiO_3$ monocrystals, it was found out that many of their properties can be changed under the influence of various factors: some crystals aged (but the aging is reversible); some crystals after being subjected to strong heating and rapid cooling down, showed (during 3 days) a reduced dielectric permittivity from 2,750 to 1,900; some barium titanate monocrystals darkened by heating in vacuum and by cathode bombardment. This darkening was not accompanied with any structural changes but electric conductivity increased to such a degree that the measuring of dielectric parameters became impossible.

43-3-1/26

TITLE: The Cultivation and Investigation of Ferroelectric Monocrystals (Vyrashchivaniye i issledovaniye monokristallov segnetoelektrikov)

Thus $BaTiO_3$ crystallization out of molten salts yielded various modifications of crystals with anomalous ferroelectric properties. By varying temperature conditions, it was possible to grow crystals with different values of the c/a ratio, including non-ferroelectric crystals.

It was later discovered that these crystals can be carried through the whole series of states by means of thermal treatment.

Monocrystals of $SrTiO_3$ were obtained by two methods:

1. Out of a molten mixture of polycrystallic $SrTiO_3$ with potassium fluoride, and
2. Out of a molten mixture of polycrystallic $SrTiO_3$ with 50 % of sodium carbonate + 50 % of potassium carbonate.

The monocrystals obtained by these two methods differed in their dielectric properties.

Monocrystals of solid solutions of the $(Ba,Sr)TiO_3$ type were obtained out of corresponding mixtures of barium and strontium titanates and molten potassium fluoride. Dielectric

Card 3/4

48-3-1/26

TITLE: The Cultivation and Investigation of Ferroelectric Monocrystals (Vyrashchivaniye i issledovaniye monokristallov segnetoelektrikov)

parameters of these monocrystals vary considerably after thermal treatment. After 3 hours of annealing under a temperature of 1,350°C the crystals darkened but acquired normal ferroelectric properties.

The extensive experience in cultivation of ferroelectric crystals has shown that crystallization conditions strongly affect their ferroelectric properties. Some ferroelectrics can stay in a metastable state for a long time after solidification.

The article contains 11 graphs and 2 photos. The bibliography lists 39 references, of which 31 are Slavic

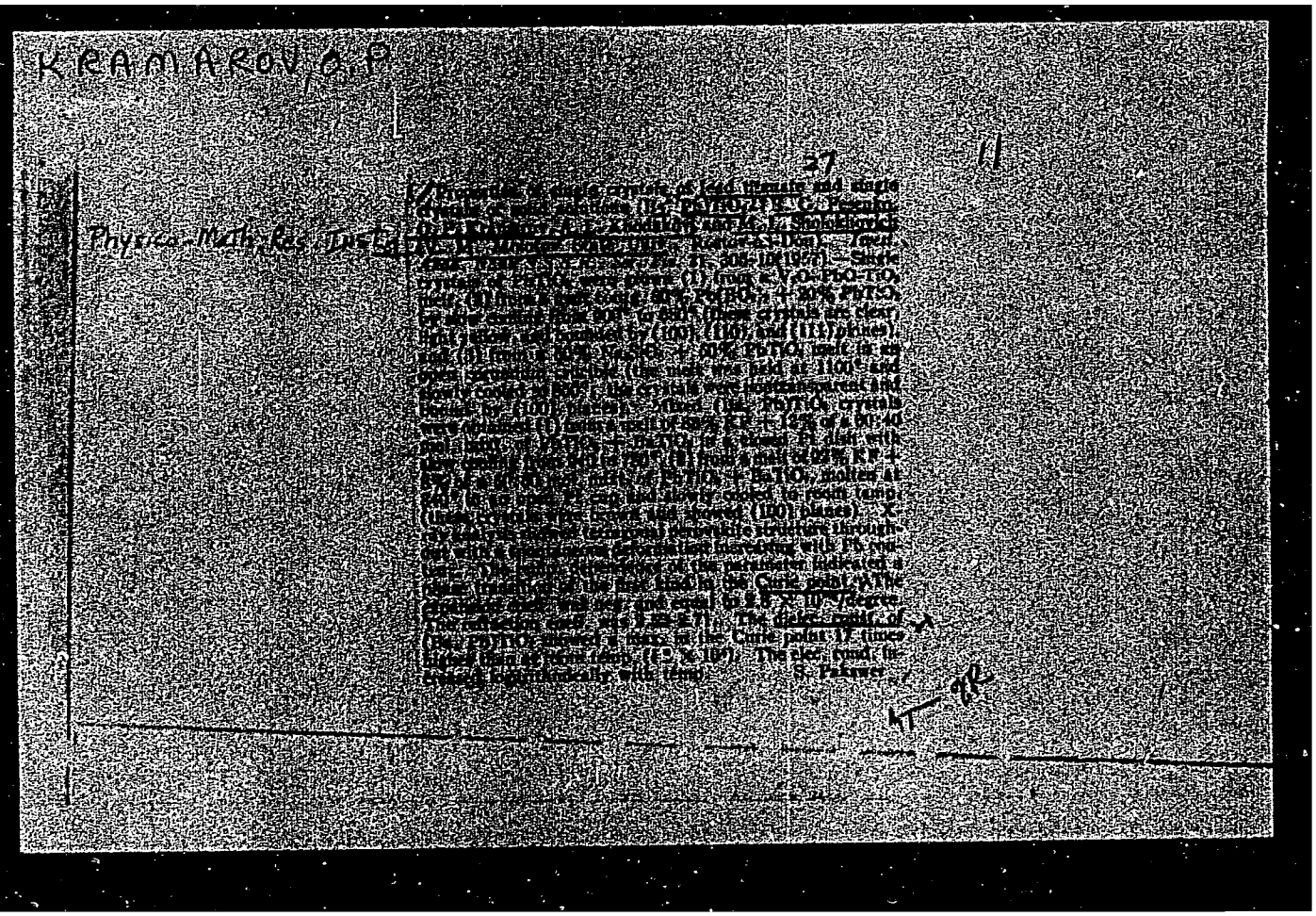
INSTITUTION: Scientific Research Physico-Mathematical Institute at the ROSTOV/DON State University im. Molotov

PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress.

Card 4/4

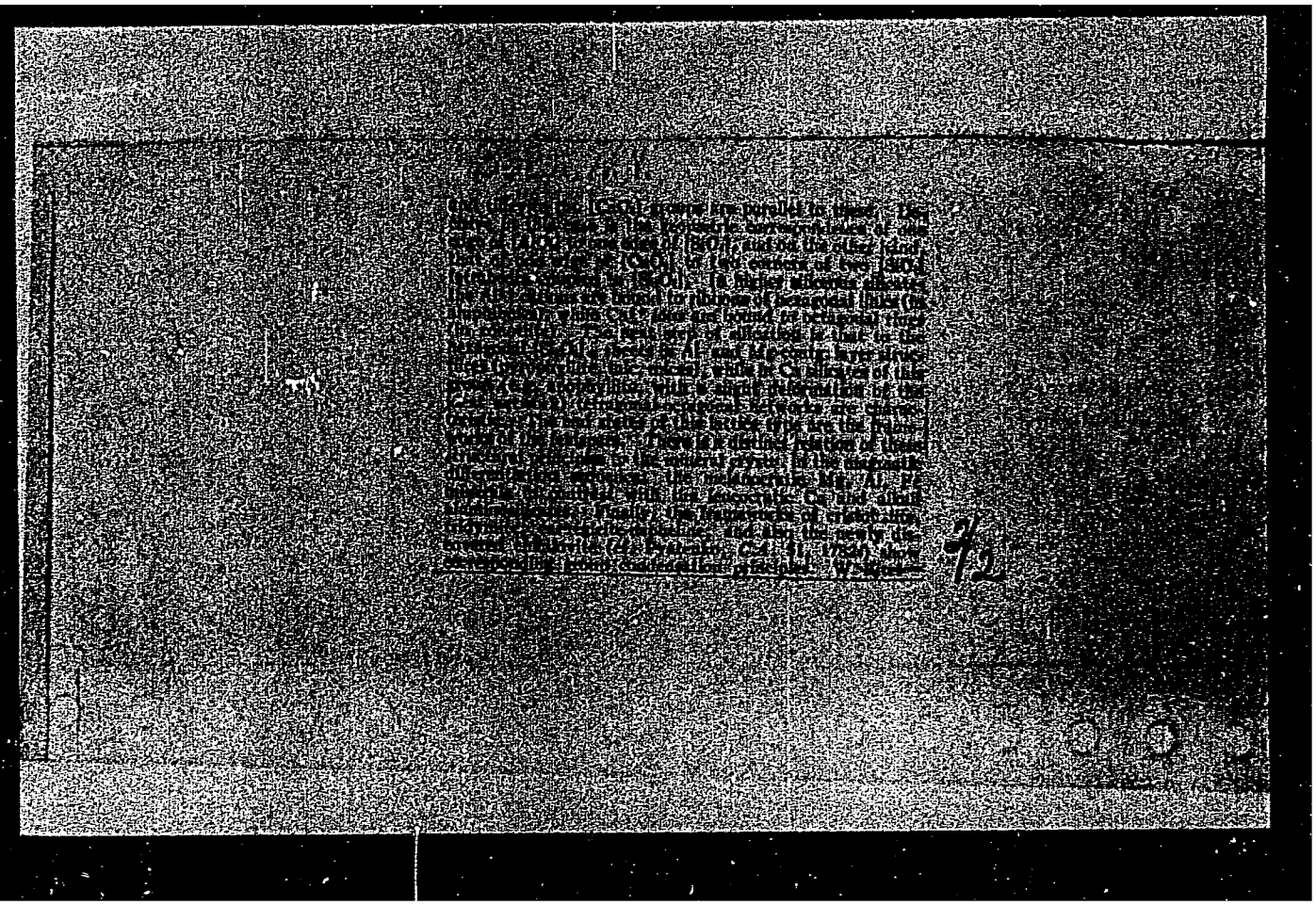


KRAMAROV, O.P.

Physico-Math. Sci.

27

11



YEVTOD'YEVA, M.Ya., KRAMAROV, O.P.

Photoelectrodermocolorimeter, a device for examining skin color.
Med.prom. 12 no.9:50-53 S'58 (MIRA 11:10)

1. Rostovskiy meditsinskiy institut i Nauchno-issledovatel'skiy fiziko-matematicheskiy institut pri Rostovskom-na-Donu gosudarstvennom universitete.
(PHYSIOLOGICAL APPARATUS)
(COLORIMENTERS)

SOV/120-59-1-26/50

AUTHORS: Blokhin, M. A., Busler, I. V., Kramarov, O. P., Chernyavskaya, I. P.

TITLE: The Use of a Monitor in X-Ray Spectral Analysis (Primeneniye monitora pri rentgeno-spektral'nom analize)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 106-111 (USSR)

ABSTRACT: In the continuous recording of intensities in X-ray spectra by means of ionisation or scintillation counters, a high stability source of the radiation is necessary. At the same time it is difficult to ensure a high stability in the anode voltage at the relatively high power used by the tube. This problem is particularly complex when the anode current has to be varied within wide limits, for example, in the measurement of the intensity ratio of a very weak and a very bright line. For this and other reasons the present authors have developed methods for measuring line intensity ratios either when the intensity is directly stabilized or when the source of the radiation is not stabilized at all. Ionisation chambers or geiger counters are used for this purpose as monitors. The device is shown diagrammatically in Fig 1. In this figure 1 is the anode of the X-ray tube. Primary X-rays leaving the anode are incident on the specimen under investigation 2 and an addit-

Card 1/3

The Use of a Monitor in X-Ray Spectral Analysis

ional specimen 3 . Fluorescence radiation leaving 2 is analyzed in a spectrometer which uses a geiger counter as the detector. The radiation from the additional specimen 3 enters the monitor 7 through a collimator 4 . The monitor is in the form of a geiger counter. The additional specimen is made from a pure element (or its oxide). The stabilization is ensured by using the output signal of the monitor to stabilize the cathode supply of the X-ray tube. The system is completely automatic, the control circuit being shown in Fig 2. It is shown that the use of a monitor in conjunction with good collimation of the direct fluorescence radiation from the additional specimen enables one to carry out accurate measurements of X-ray intensities without any stabilization of the supplies. Fig 4 shows a typical spectrum obtained with this instrument. Fig 3 shows the root mean square error in the intensity of the K_α line as a function of the atomic number Z of the specimen under investigation, the additional specimen being Ni . It follows from this figure that if a

The Use of a Monitor in X-Ray Spectral Analysis

relative error of 3% is sufficient (the number of counts taken being sufficiently high, i.e. the statistical error being low) then the atomic number of the specimen under investigation may differ from the corresponding number of the additional specimen by 4 . Hence altogether nine neighbouring elements may be investigated whose atomic numbers are symmetrically placed on either side of the atomic number of the additional specimen. If the relative statistical counting error does not exceed 4%, then for the above 3% the final relative error would be less than 5%. Thus almost the entire spectral region normally used in analysis by long wave spectrometers may be covered, using a single additional specimen, for example, a chromium specimen. Typical results are shown in Fig 4. There are 4 figures, 2 tables and 12 references, of which 8 are English, 1 is Japanese in English and the rest are Soviet.

ASSOCIATION: Rostovskiy-na-Donu gosudarstvennyy universitet (Rostov-na-Donu State University)

SUBMITTED: January 18, 1958.

SOV/70-4-1-18/26

AUTHORS: Novosil'tsev, N.S. (Deceased), Khodakov, A.K., Sholokhovich, M.L., Fesenko, Ye.G. and Kramarov, O.P.

TITLE: Experimental Work on Growing Single Crystals of Ferroelectrics (Opyt raboty po vyrashchivaniyu monokristallov segnetoelektrikov)

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 1, pp 101 - 108 (USSR)

ABSTRACT: General review of work on (Ba, Pb)(Ti, Zr)O_3 ferroelectrics. There is a considerable difference between the observed and calculated densities of perovskite ceramics indicating disordered regions between domains. Colour and electrical conductivity are also variable. Attempts were made to grow $SrTiO_3$ by the Verneuil process but complications due to the formation of the hexagonal phase occurred and lowered permittivity. Growth from the melt has also been tried using an arc furnace but difficulties with oxygen deficiency and the metastable hexagonal phase again arose. Remejka (Ref 46) reported that the presence of iron oxide hindered the formation of oxygen defects but only 1.5% ferrate in $BaTiO_3$ gave

a hexagonal structure. In 1956, zone refining was tried very successfully, crystals greater than 1 cm being obtained but attention has turned to the use of crystals with artificially introduced disordering. It was found in 1951-2 that appropriate thermal treatment could restore $BaTiO_3$ with poor permittivity curves to the proper state and the composition to the equilibrium value. In 1953, it was found that foreign atoms could alter the temperature variation of physical properties and solid solutions of $BaTiO_3$-$BaSnO_3$-$BaZrO_3$ were studied. Because of applications to memory devices, the interest in single crystals and their electrical properties increased. Melts of KF were used for obtaining crystals of $(Ba,Pb)TiO_3$ and $(Sr,Ba)TiO_3$. Dielectric properties have been measured at from 50 to 10^6 c/s, including recording of the hysteresis loop under various conditions. Linear expansion

Experimental Work on Growing Single Crystals of Ferroelectrics

coefficients have been measured as has the dependence of Curie point on composition. A volume jump at the Curie point can be shown dilatometrically. X-ray measurements for $(Ba_{0.5}, Pb_{0.5})TiO_3$ single crystals gave $a = 3.965$, $c = 4.037$ Å and $c/n = 1.018$ at 20 °C. Twinning has been studied optically and supercooling at the transition through the Curie point has been shown. Cinematographic records of jump-like transitions (at about 500 °C) taking 0.1 to 0.4 sec at a rate of heating of 2-4°/min have been made. The changes in domain structure in electric fields have been followed. There are 3 figures and 48 references, 44 of which are Soviet, 2 English, 1 Dutch and 1 international.

ASSOCIATION: Rostovskiy-na-Donu gos. universitet (Rostov-na-Donu State University)

SUBMITTED: December 7, 1958

Card 3/3

AUTHOR: Kramarov, O.P. SOV/70-4-1-19/26

TITLE: Growing Single Crystals of Ferroelectrics by the Method of Zone Recrystallisation (Polucheniye monokristallov segnetoelektrikov metodom zonnoy rekristallizatsii)

PERIODICAL: Kristallografiya, 1959, Vol 4, Nr 1, pp 109-113 (USSR)

ABSTRACT: Zone refining can be carried out without a crucible at a temperature below the melting point, recrystallisation taking place in the solid phase. An electrically heated vertical tube was used with the hottest point in the centre and a steep temperature gradient. The maximum temperature reached was 1800 - 1900 °C. The specimens of $BaTiO_3$ used were formed by ceramic technique into rods 50 mm long and 3-5 mm in diameter. The rod was moved through at 1-20 mm/h and one pass through the hot zone was sufficient to convert it to a single crystal. The resulting rod had rough velvety surfaces and the orientation could be found by optical reflection. Many defects, mostly occurring as gas inclusions, were found although the porosity of the recrystallised rod was less than in the original sinter.

Card1/3

The density was 5.8-5.9 g/cm^3. The colour was darkened by heating in the atmosphere of the furnace and depended on the space available for the circulation of air. If air had ready access the material remained clear. Tests were made keeping the specimen stationary and it was found that three sharply separated regions were distinguishable;
1) an unfused, soft part, unchanged since the preliminary heating to 1 200°;
2) fused zone, externally glassy, like ceramic $BaTiO_3$ with an oxygen deficiency,
3) the zone of maximum temperature where crystal growth had occurred; the colour is here dark with violet-grey characteristic of trivalent compounds of Ti.
Impurities greatly affect the production of single crystals. 0.75-1.0% TiO_2 markedly facilitates crystallisation and hinders the formation of the hexagonal shape which sometimes occurs for the stoichiometric composition. Fe_2O_3 also hastens crystallisation but always gave the hexagonal form.

Growing Single Crystals of Ferroelectrics by the Method of Zone Recrystallisation SOV/70-4-1-19/26

Experiments were made in producing (Ba, Pb)TiO_3 solid solutions (6% $PbTiO_3$) and the addition lowered the recrystallisation temperature to 1 500 - 1 530 °C. Specimens did not darken and remained transparent. The method is obviously of much wider application - perhaps to Al_2O_3.

Acknowledgments are made to N.S. Novosil'tsev and A.L. Khodakov. There are 5 figures and 9 references, 6 of which are Soviet, 2 English and 1 Swiss.

ASSOCIATION: Nauchno-issledovatel'skiy fiziko-matematicheskiy institut pri Rostovskom-na-Donu gos. universitete (Physico-mathematical Scientific Research Institute of the Rostov-na-Don State University)

SUBMITTED: December 7, 1958

Card 3/3

85010

9.2180

S/048/60/024/010/019/033
B013/B063

AUTHOR: Kramarov, O. P.

TITLE: Production of Piezoelectric Monocrystals From Melts

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 10, pp. 1251-1254

TEXT: The author describes a new apparatus for the production of monocrystals by zone melting without crucibles and by Verneuil's method. The heating element of the furnace of the universal apparatus was made of silite. Such heating elements proved to withstand a temperature of 1600 ÷ 1650°C in air for a long period and a temperature of 1650 ÷ 1700°C for a short period. These temperatures are sufficient for melting numerous piezoelectric substances. Several designs of the furnace and the heating element were tested. The best results were obtained with the design shown in Fig. 1. When applying Verneuil's method, a mechanism is fitted on top of the furnace for the introductic of the powder. This mechanism is shown in Fig. 2. Zone melting tests re made with the furnace shown in

Card 1/2

85010

Production of Piezoelectric Monocrystals From Melts

S/048/60/024/010/019/033
B013/B063

Fig. 2. Samples of solid $BaTiO_3$ + 5%$SrTiO_3$ solutions and barium titanate powder were melted. The experiments have shown that the furnace is easy to control, and that zone melting of piezoelectric substances is also easily possible. Samples subjected to zone melting contained blocks of monocrystals, while inclusions were almost completely absent. Dielectric measurements indicated that the non-linearity of the samples was increased as compared to the ceramic material used. Molten blocks of $BaTiO_3$ were also obtained when using Verneuil's method. They exhibited a coarsely crystalline structure with a small number of pores. The author thanks A. L. Khodakov for supervising this work. The present paper was read at the Third Conference on Piezoelectricity, which took place in Moscow from January 25 to 30, 1960. There are 4 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-matematicheskiy nauchno-issledovatel'skiy institut pri Rostovskom-na-Donu gos. universitete (Scientific Research Institute of Physics and Mathematics of Rostov-na-Donu State University)

Card 2/2

S/564/57/000/000/022/029
D258/D307

AUTHORS: Khodakov, A. L., Sholokhovich, M. L., Fesenko, Ye. G., and Kramarov, O. P.

TITLE: Preparation and dielectric and optical properties of single crystals of the solid solutions (Ba-Sr) TiO_3

SOURCE: Rost kristallov; doklady na Pervom soveshchanii po rostu kristallov, 1956 g. Moscow, Izd-vo AN SSSR, 1957, 294-304

TEXT: Monocrystals of $BaTiO_3$, $SrTiO_3$ and (Ba-Sr)TiO_3 (from 95 to 50% $BaTiO_3$) were grown from K_2F_2 melts, in view of the theoretical and practical interest of these seignetto-electric materials. This method is based on the study of the K_2F_2 - $BaTiO_3$ - $SrTiO_3$ system, studied by the authors up to

1100°C, which showed that this system contains a continuous series of solid solutions $(Ba-Sr)TiO_3$. Measurements of dielectric permeability and the loss angle at temperatures from -180° to +150°C showed that the dielectric properties of $(Ba-Sr)TiO_3$ crystals change considerably with temperature, similarly to $BaTiO_3$; furthermore, prior to thermal treatment, the monocrystals exhibited only weak seignettoelectric properties but became typical seignettoelectrics after heating at 1350°C. X-ray and optical examination showed the solid solution crystals to be almost ideally cubic, anisotropic, and those not subjected to heat treatment contained domains at temperatures considerably above which the dielectric permeability reached a maximum. The domain structure disappeared at higher temperatures. There are 9 figures and 4 tables.

ASSOCIATION: NIFMI pri Rostovskom n/D Gosudarstvennom universitete (NIFMI, Rostov-on-Don State University)

S/048/60/024/010/032/033
B013/B063

AUTHOR: Kramarov, O. P.

TITLE: A Method for the Quick Production and Examination of Piezoceramic Materials

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 10, pp. 1300 - 1303

TEXT: The author tested several methods for the production of ceramic samples of variable composition. He obtained the best results by means of the device shown in Fig.1. The sample was pressed after a sufficiently thick layer had been introduced. To give it mechanical strength, it was first burned in an ordinary furnace at 1000 ÷ 1100°C. Then, it was suspended and sintered in a furnace with a given temperature gradient. The design of this furnace is shown in Fig.2, which is supplemented by a curve representing the temperature distribution. Burning in a furnace with a given temperature gradient produces samples whose composition varies steadily on one side at a constant temperature, whereas the

sintering temperature varies on the other side. Thus, it forms a coordinate plane: composition - sintering temperature. By applying a suitable die pattern onto the electrodes it is possible to study, on one sample, the dielectric properties of several compositions depending on the sintering temperature. Of particular advantage is the use of a furnace with a given temperature gradient for samples of one composition. In this case, the design of the furnace may be slightly modified (Refs. 2 and 3). With the help of such a furnace it was possible to establish various anomalies in ceramic samples at sintering temperatures of $1170 \div 1210^{0}$ (Fig.3). A microscopic structural analysis has shown that the growth of crystals below and above this temperature was of entirely different character. Fig.4 shows microphotographs of the surface structure of several parts of samples burned at different temperatures. The temperature dependence of the dielectric constants of $BaTiO_3$ samples is illustrated in Fig.5. A preliminary X-ray structural analysis of the crystal lattice did not show any particular features within the region of expansion. So far, there is no explanation available for the phenomenon observed. Expansion proceeds very rapidly, and should be taken

V

A Method for the Quick Production and Examination of Piezoceramic Materials

S/048/60/024/010/032/033
B013/B063

into account when producing piezoceramic materials. To avoid any rejects, due to cracks and porosity, the critical temperature of 1170 ÷ 1210°C must be quickly surpassed during sintering. The author thanks A. L. Khodakov for supervising the work. S. A. Vekshinskiy is mentioned. The present paper was read at the Third Conference on Piezoelectricity, which took place in Moscow from January 25 to 30, 1960. There are 5 figures and 4 references: 3 Soviet.

ASSOCIATION: Fiziko-matematicheskiy nauchno-issledovatel'skiy institut pri Rostovskom-na-Donu gos. universitete (Scientific Research Institute of Physics and Mathematics of Rostov-na-Donu State University)

Card 3/3

S/196/63/000/001/004/035
E193/E383

AUTHORS: Kramarov, O.P., Khodakov, A.L., Sholokhovich, M.L. and Fesenko, Ye.G.

TITLE: Single crystals of solid solutions of strontium and lead titanates

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no. 1, 1963, 15, abstract 1 B51. (In collection: Segnetoelektriki (Ferroelectrics), Rostov-na-Donu, Rostovsk. un-t, 1961, 5-11)

TEXT: Single crystals of (Pb, Sr)TiO_3 solid solutions, crystallized out of $PbTiO_3$-$SrTiO_3$-KF melts cooled slowly (5-10 °C/h) in a platinum crucible, were studied. Specimens containing 10, 25, 40 and 50 mole.% $PbTiO_3$ were obtained in the 1273-1103 °K range (i.e. at 1000-830 °C), those containing 60 and 75% $PbTiO_3$ being crystallized out of melts cooled from 1373 °K (1100 °C). It was established that with increasing quantity of Sr ions, isomorphically displaced in $SrTiO_3$ by Pb ions, the lattice parameter increased owing to the difference in the ionic radii. X-ray spectrum analysis showed that the composition of specimens prepared in this manner was practically identical with the

Card 1/3

composition of the charge. The temperature dependence of ε and $\tan\delta$ in the 73-673 °K range (i.e. at -200 to +400 °C) was studied at 10^6 c.p.s. (see the figure; the numbers by each curve indicate percentage concentration of $PbTiO_3$ in the $PbTiO_3$-$SrTiO_3$ solid solution and at a frequency f = 50 c.p.s. The values of θ of single crystals were found to be near the known values for polycrystalline specimens. The magnitude of tan δ increased slightly with increasing Pb content and, at its minimum, was equal to (40-70) x 10^{-4}. The values of $\hat{e}$ of specimens with high specific conductivity were determined with the aid of a specially designed dilatometer, capable of measuring expansion on specimens 1-2 mm long. With the aid of this method it was possible to establish that the temperature of phase-transformation of $PbTiO_3$ was 785 °K (512 °C). The hysteresis loops studied at room temperature at f = 50 c.p.s. in fields of up to 12 kV/cm had no saturation. It was established that the refractive index of $PbTiO_3$-$SrTiO_3$ solid solutions varied non-monotonically from 2.35 for the latter to 2.70 for the former compound. There are 4 figures and 10references.

S/196/63/000/001/007/035
E193/E383

AUTHORS: Sholokhovich, M.L., Kramarov, O.P. and Varicheva, V.I.

TITLE: Single crystals of lead metazirconate

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no. 1, 1963, 17-18, abstract 1 B56. (In collection: Segnetoelektriki (Ferroelectrics), Rostov-na-Donu, Rostovsk. un-t, 1961, 31-36)

TEXT: A method is described for growing single crystals of $PbZrO_3$, up to 30 μ in size, from melts containing PbO and ZrO_2 mixtures dissolved in KF, KCl, PbF_2, $Pb_3(PO_4)_2$, NaCl, Na_2WO_4 or Na_2MoO_4. Another method, entailing the volatilization of NaCl from a $PbO-ZrO_2-PbCl_2$ melt, made it possible to produce $PbZrO_3$ single crystals, 1-2 mm in size, for which the temperature-dependence of ε was determined (see the figure). The effect of temperature on the hysteresis loops was also studied. There are 1 figure and 13 references.

Editor's note. In the original the frequency is erroneously given in "mc/s" instead of "Mc/s".

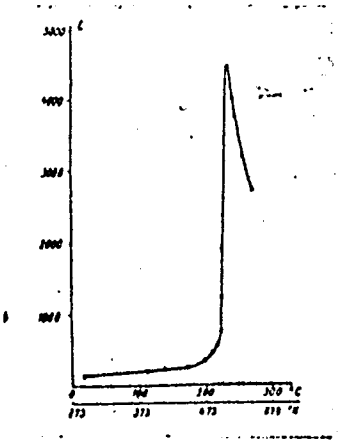
Card 1/2

S/196/63/000/001/007/035
E193/E383

Single crystals of ....

[Abstracter's note: Complete translation.]

Figure:



Card 2/2

S/196/63/000/001/013/035
E194/E155

AUTHOR: Kramarov, O.P.

TITLE: Devices and equipment for studying the dielectric properties of small samples of ferro-electrics

PERIODICAL: Referativnyy zhurnal, Elektrotekhnika i energetika, no.1, 1963, 21, abstract 1 B 69. (In collection: Segnetoelektriki (Ferroelectrics), Rostov-na-Donu, Rostovsk. un-t, 1961, 134-146)

TEXT: A detailed description is given of equipment for measuring ε and tan δ as functions of temperature in the range 413 °K (+140 °C) to 73 °K (-200 °C) and from room temperature up to 873 °K (600 °C) of small specimens of ferroelectrics (ranging in size from 0.25 to 4 - 5 mm^3 and with capacitance of the order of 1 - 3 pF and above) in the frequency range up to 30 Mc/s. The capacitance can be measured to an accuracy of ± 10% (at the higher frequencies the error is greater because of the lead inductance). Oscillographic equipment for determining the hysteresis loop in the range of 50 - 1000 c/s and the temperature range from

Card 1/2

Devides and equipment for studying ... S/196/63/000/001/013/035
E194/E155

73 °K (-200 °C) to 773 °K (+500 °C) with a maximum effective working stress of 1 kV is described in detail, and also equipment for measuring the conductivity and the reversible permittivity. 8 figures. 4 references.

[Abstractor's note: Complete translation.]

Card 2/2

S/058/62/000/006/067/136
A061/A101

AUTHOR: Kramarov, O. P.

TITLE: Some characteristics of the production of ferroelectric single crystals by the method of zone recrystallization

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 12, abstract 6E100 (In collection: "Rost kristallov. T.3". Moscow, AN SSSR, 1961, 451 - 456. Discuss., 501 - 502)

TEXT: The effect of thermal treatment and impurities on the granular growth of polycrystalline $BaTiO_3$ specimens in the process of zone recrystallization has been investigated. It has been established that some impurities (1% Al_2O_3) inhibit the process of recrystallization, whereas oxides of nickel, chromium, cobalt, and manganese favor it. Ferric oxides give rise to a hexagonal structure, while a TiO_2 excess (1%) prevents the change into hexagonal modification and favors recrystallization.

I. Kamentsev

[Abstracter's note: Complete translation]

Card 1/1

L 10040-63 EWT(1)/EPF(n)-2/EWP(q)/EWT(m)/BDS/T-2/EEC(b)-2/ES(s)-2--AFFTC/ASD/ESD-3/SSD--Pu-4/Pt-4--GG/IJP(C)/WH/JD

ACCESSION NR: AR3000359 S/0058/63/000/004/E051/E051

SOURCE: RZh. Fizika, Abs. 4E343

AUTHOR: Fesenko, Ye. G.; Kramarov, O. P.; Komarov, V. D.; Shpolyanskiy, Ya. A.

TITLE: Investigation of the effect of isomorphous substitution of Ti ions by Cr, Mn, Co, and Ni ions on phase transformations in BaTiO sub 3

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk. un-t, 1961, 96-100

TOPIC TAGS: Barium titanate, effect of isomorphous substitutions, dielectric properties, piezoelectric modulus

TRANSLATION: An X-ray structural investigation was made of Ba Ti O sub 3 with different additives, the dielectric constant Epsilon was measured by a resonant method, and the static piezo-modulus was measured. Replacement of the Ti ions with Ni and Co ions leads to a reduction in the transition temperature of the perovskite modification into a hexagon. With increasing Ni concentration, a decrease in the Curie temperature and in the maximum of Epsilon takes place, and

Card 1/2

L 10040-63
ACCESSION NR: AR3000359

at a concentration Ni greater than 2%, the ferroelectric properties disappear. The decrease in the Curie temperature is connected with a decrease of the spontaneous deformation of Ba Ti O sub 3 upon introduction of the Ni ions, while the decrease of Epsilon and the disappearance of the ferroelectric properties with appearance of non-ferroelectric hexagonal modification. The piezo-modulus of specimens with 0.15% nickel does not change, while at 0.5% it decreases to 220-250 absolute units, and at the same time there is a noticeable increase in the stability of the piezo-modulus with time. For specimens with Co, no hexagonal phase is observed up to 8% Co. The piezo-modulus d sub 3 sub 3 in specimens with 1.5-6% Co amounts to 350-450 absolute units and has high time stability. For specimens with Cr and Mn, a characteristic feature is a reduction in Epsilon without a change in the Curie temperature, this being connected with the formation of the hexagonal phase. When the content of Cr and Mn is greater than 2%, the hexagonal phase occupies more than 50% of the volume of the specimen, while the remaining volume contains the perovskite modification with a spontaneous deformation 0.01 which is characteristic of Ba Ti O sub 3. The piezo-modulus does not change upon introduction of Cr and Mn. L. Mirkin

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH

cs/ja
Card 2/2

L 10060-63 EWT(1)/EWP(q)/EWT(m)/BDS/EEC(b)-2/ES(s)-2--AFFTC/ASD/ESD-3/APGC--Pt-4--GG/WH/IJP(C)

ACCESSION NR: AR3000370 S/0058/63/000/004/E055/E055

SOURCE: RZh. Fizika, Abs. 4E375

AUTHOR: Kramarov, O. P.; Khodakov, A. L.

TITLE: Quartz dilatometers

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk. un-t, 1961, 152-157

TOPIC TAGS: Quartz dilatometers, measurement of ferroelectric properties, expansion coefficient

TRANSLATION: Constructions are described of quartz dilatometers for the measurement of the coefficient of linear expansion (Alpha) of large (up to 50 mm) and small (0.5 - 1.0 mm) specimens of ferroelectrics. The measuring unit of the quartz dilatometer for large specimens is a capacitance meter, built in the form of a resonant circuit and detecting a change in capacitance of 0.01 pf, making it possible to measure Alpha up to 5 times 10 sup -7 with an error of 5%. The value

Card 1/2

L 10060-63

ACCESSION NR: AR3000370

of Alpha of small specimens is measured by means of a tooth and lever micrometer with a reading microscope, which detects change in the dimension of the specimen up to 0.1 micron. The backlash of the quartz dilatometer amounts to plus or minus 0.3 micron. The construction of the quartz dilatometer makes it possible to carry out measurements in the temperature range from -170 to 550 degrees C. A. Fotchenkov

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH

cs/

Card 2/2

L 15629-65 EWT(1)/EPA(s)-2/EWT(m)/EEC(t)/EWP(t)/EEC(b)-2/EWP(b) Pt-10/Pl-4
ASD-3/AFFTC/ESD-3/SSD/IJP(c) JD/GG
ACCESSION NR: AR3010278 S/0081/63/000/012/0071/0071

SOURCE: RZh. Khimiya, Abs. 12B466

AUTHOR: Kramarov, O. P.; Khodakov, A. L.; Sholokhovich, M. L.; Fesenko, Ye. G.

TITLE: Monocrystals of solid solutions of strontium and lead titanates

CITED SOURCE: Sb. Segnetoelektriki. Rostov-na-Donu, Rostovsk. un-t, 1961, 5-11

TOPIC TAGS: solid solution, strontium, lead, strontium titanate, lead titanate, monocrystalline structure

TRANSLATION: The fusion diagram for the system K_2F_2--$PbTiO_3$--$SrTiO_3$ has been studied and the formation of a continuous series of solid solutions $(Pb--Sr)TiO_3$ has been established. For determining the position of the Curie point in compounds with high electrical conductivity, a specially constructed dilatometer was used which permitted measurement of elongation in samples of 1-2 mm. A phase

Card 1/2

L 15629-65
ACCESSION NR: AR3010278

transition temperature of 512° for monocrystals of $PbTiO_3$ was determined by the same method. The Curie point for monocrystals of solid solutions is close to the data known for polycrystalline samples. The refractive index for monocrystals $(Pb-Sr)TiO_3$ changes in a nonmonotonic fashion within the limits of 2.35 (for $SrTiO_3$) to 2.70 (for $PbTiO_3$).

SUB CODE: MM, SS ENCL: 00

Card 2/2

L 7841-66 EWT(l)/EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(t)/EWP(b)
ACC NR: AP5028121 IJP(c) JD/GG/WH SOURCE CODE: UR/0048/65/029/011/2064/2067

AUTHOR: Kramarov,O.P.; Sholokhovich,M.L.; Granovskiy,V.G.; Berberova,L.M; Nikulina,V.P.

ORG: Rostov-on-the Don State University (Rostovskiy-na-Donu gosudarstvennyy universitet)

TITLE: Increase of the Curie point of ferroelectric materials by introduction of nonferroelectric dopants [Report, Fourth All-Union Conference on Ferro-electricity held at Rostov-on-the Don 12-16 September 1964]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 11, 1965, 2064-2067

TOPIC TAGS: ferroelectric material, solid solution, dopant, barium titanate, zirconium, copper, silicon, dielectric constant, dielectric relaxation, Curie point.

ABSTRACT: The temperature dependence of the dielectric constant of $BaTiO_3$ and ferroelectric (Ba, Sr)TiO_3 and Ba(Ti, Zr)O_3 solid solutions containing up to 10 mole % of $CaTiO_3$, $BaSiO_3$, or $CuTiO_3$ ($CuCO_3 + TiO_2$) was measured at 10^3 and 10^6 cycle/sec in order to determine whether relaxation processes are involved in the apparent increase of the Curie temperature to which these nonferroelectric dopants are known to give rise. In all cases the dielectric constant was independent of frequency and the temperature at which it reached its maximum increased with increasing dopant content. The measurements on the $BaTiO_3$--$BaSiO_3$ system were repeated with particular attention to the purity of the materials, cp $BaTiO_3$ synthesized by the oxalate method, cp $BaCO_3$,

Card 1/2

L 7841-66

ACC NR: AP5028121

and semiconductor-grade SiO_3 being employed. The Curie point of the cp $BaTiO_3$ was higher than that of the less pure material, but it was raised still higher by addition of the pure $BaSiO_3$. It is concluded that relaxation processes are not involved, but that a true increase of the Curie point takes place. The ferroelectric nature of the dielectric constant maximum in the doped materials was confirmed by observation of the hysteresis loops. The addition of the nonferroelectric dopant lead in all cases to a broadening of the dielectric constant peak (diffusion of the phase transition) and in most cases to a reduction of the maximum value of the dielectric constant. The results are discussed briefly in terms of the theory of A.L.Khodakov and V.G.Granovskiy (Izv. vysh. uchebn. zaved, Fizika, No. 2, 118 (1962)). "Fictitious Curie points" are assigned to the dopants, from which their influence on the Curie point of the doped ferroelectric can be calculated. It is suggested that it may be possible to obtain ferroelectric solid solutions of nonferroelectric components homologous with $BaTiO_3$. It is not possible, however, to characterize the effect of a dopant by any single property of the added ion as, e.g., its polarizability. Further investigation is desirable. Orig. art. has: 1 formula and 5 tables.

SUB CODE: SS, EM SUBM DATE: 00/ ORIG.REF: 007 OTH.REF: 002

nw

Card 2/2

L 7834-66 EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(t)/EWP(b)/EWA(h)

ACC NR: AP5028122 IJP(c) JD/WH SOURCE CODE: UR/0048/65/029/011/2068/2071

AUTHOR: Sholokhovich,M.L.; Novikova,L.V.; Varicheva,V.I.; Kramarov,O.P.; Kupriyanov,M.F.

ORG: Rostov-on-the Don State University (Rostovskiy-na-Donu gosudarstvennyy universitet)

TITLE: Preparation of solid solutions of barium and lead titanates from water-soluble compounds and characteristics of such solutions /Report, Fourth All-Union Conference on Ferroelectricity held at Rostov-on-the Don 12-16 September 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 11, 1965, 2068-2071

TOPIC TAGS: ferroelectric material, solid solution, barium titanate, lead, titanate, dielectric constant, Curie point

ABSTRACT: Chemically pure (Ba, Pb)TiO_3 solid solutions were prepared from water-soluble reagents by coprecipitation from titanium tetrachloride, barium chloride, and lead nitrate solution, and by the exchange reaction between potassium titanyl oxalate and lead and barium nitrates. The chemical procedures are discussed in some detail and the properties of the solid solutions are described briefly. Lead titanyl oxalate synthesized at room temperature from titanium tetrachloride and lead nitrate by the method of B.V.Strizhkov, A.V.Lapitskiy, and L.G.Vlasov (Zh. prikl. khim., 34, 673 (1960)) was always contaminated with lead chloride, as were also the coprecipated mix-

Card 1/2

L 7834-66

ACC NR: AP5028122

tures of lead and barium titanyl oxalates. It was not possible so to adjust the pH as to eliminate this contamination. Lead chloride also precipitated when the synthesis was performed at 80°C by the method of W.S.Clabaugh, E.M.Swiggard, and R.Gilchrist (J. Res. Natl. Bur. Standards, 56, No. 5, 289 (1956)) and could only be removed (together with some of the titanyl oxalates) by prolonged washing with hot water. X-ray studies of the coprecipitated materials clearly showed the formation of tetragonal solid solutions after heating to 800°. The degree of tetragonality decreased regularly from lead to barium. The resulting chemically pure solid solutions sintered poorly and it was not possible to obtain dense ferroelectric ceramics by sintering in air at 1100 to 1300°. The Curie point of a ceramic of the composition $(Ba_{0.95}, Pb_{0.05})TiO_3$, derived from the temperature dependence of the dielectric constant at 1 megacycle/sec, was 153°. This is considerably higher than the approximately 140° Curie point usually obtained for ceramics of this composition prepared from technical grade materials. The increase of the Curie temperature is ascribed to the purity of the material. The dielectric constant itself was lower than is usually obtained for ceramics of this composition, owing to the large porosity due to poor sintering. Orig. art. has: 1 figure and 3 tables.

SUB CODE: GC, SS, EM SUBM. DATE: 00/ ORIG.REF: 009 OTH.REF: 002

2/2

Card 2/2

L 7355-66 EWP(e)/EPA(s)-2/EWT(m)/EWP(i)/EPA(w)-2/EWP(b)/EWA(h) WH

ACC NR: AP5028127 SOURCE CODE: UR/0048/65/029/011/2086/2090

AUTHOR: Balash, V.A.; Kramarov, O. P.; Shpolyanskiy, Ya. A.

ORG: none

TITLE: Investigation of the direct and inverse piezoelectric effects in ferroelectric ceramics [Report, Fourth All-Union Conference on Ferro-electricity held at Rostov-on-the Don 12-16 September 1964]

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 11, 1965, 2086-2090

TOPIC TAGS: ferroelectric material, piezoelectric ceramic, piezoelectric modulus, electric polarization, solid solution, barium titanate, lead, strontium, zirconate, niobium, calcium, cobalt, dielectric constant

ABSTRACT: The direct and inverse piezoelectric effects were investigated in $30 \times 3 \times 1.5$ mm^3 specimens of polarized and unpolarized ferroelectric ceramics with the compositions $Pb_{0.95}Sr_{0.05}(Zr_{0.53}Ti_{0.47})O_3$ + 1% Nb_2O_5 and $(Ba_{0.95}Ca_{0.05})TiO_3$ + + 0.75% $CoCO_3$ in fields up to 26 kV/cm and at stresses up to 25 kg/cm^2. The strain gauge employed in the static measurements had a sensitivity of 10^{-6} cm/scale division. The specimens were poled for 1 hour at 140°C in a 20 kV/cm field. The deformation hysteresis loops of the unpolarized materials, recorded in cyclicly varying electric fields, were symmetric and had sharp minima, the positions of which depended on the maximum strength of the electric field. The corresponding hysteresis loops of the

Card 1/2

L 7855-66

ACC NR: AP5028127

polarized materials were asymmetric; the minima were shifted in the direction opposite to that of the polarizing field and the deformation maxima were greater when the applied field was in the direction of the polarization. A tendency to saturation was evinced at the deformation maxima. The deformation in the direction of the applied field was greater than that in the perpendicular direction by a factor 3 for the barium titanate base material and by a factor 4 for the lead titanate-zirconate base material. Piezoelectric moduli were measured both statically and by the resonance - antiresonance method. Lower values were obtained for the modulus d_{31} when it was measured dynamically than when it was measured under static conditions. The magnitudes of the static piezoelectric moduli depended on the sign of the deformation during measurement. Dielectric constants were measured under the same conditions as were the piezoelectric moduli. The ratio of the modulus to the dielectric constant was found to be much less sensitive to the conditions of measurement than modulus and the dielectric constant themselves; the ratio was the same whether measured statically or dynamically. Orig. art. has: 3 formulas, 4 figures and 2 tables.

SUB CODE: SS, ME, EM SUBM. DATE: 00/ ORIG. REF: 006 OTH. REF: 002

Card 2/2

L 15948-66 EWP(e)/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b) IJP(c) JD/WW/JG/WH

ACC NR: AT6002254 (N) SOURCE CODE: UR/2564/65/006/000/0226/0228

AUTHOR: Kramarov, O. P.

ORG: None

TITLE: Growing of lead metaniobate single crystals by zone melting [Paper presented at the Third Conference on Crystal Growing held in Moscow from 18 to 25 November, 1963]

SOURCE: AN SSSR. Institut kristallografii. Rost kristallov, v. 6, 1965, 226-228

TOPIC TAGS: crystal growing, lead compound, niobate, zone melting, single crystal

ABSTRACT: Zone melting was carried out on presynthesized $PbNb_2O_6$ powder in platinum crucibles at zone travel rates of 5 to 50 mm/hr. The surface of the samples obtained had cracks perpendicular to the direction of zone travel. The cracking took place independently of the zone travel rate, shape of crucible, or magnitude of overheating in the molten zone. Various refractory materials were tried for the crucible (stainless and heat-resistant steels, graphite, high-alumina ceramics, nickel, etc.), but all were insufficiently stable and react with $PbNb_2O_6$ at high temperatures. The temperature de-

Card 1/2

L 15948-66

ACC NR: AT6002254

pendence of the dielectric constant of the $PbNb_2O_6$ samples obtained was studied in the direction of the axis of crystallization and at right angles to it: at the Curie point, the dielectric constants of the samples differ from one another by a factor of 5 — 6. At room temperature, they are almost identical. The phase transition is accompanied by a temperature hysteresis. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001

FW

Card 2/2

KRAMAROV, P.I.; KHAMISH, L.Ya. (Kiyev)

Characteristics of work organization and some modifications of the conveyor design on small-output production lines. Shvein. prom. no.1:6-7 Ja-F '63. (MIRA 16:4)

(Clothing industry)
(Assembly-line methods)

KRAMAROV, V.S.

In the Ukrainian Academy of Agricultural Sciences. Mekh.i elek.sots.sel'khoz 17 no.3:60-61 '59. (MIRA 12:8)
(Ukraine--Agricultural research)
(Agricultural machinery)

GROZIN, Boris Dmitriyevich; DRAYGOR, David Abramovich, doktor tekhn.nauk; SEMIROG-ORLIK, Vsevolod Nikolayevich, kand.tekhn.nauk; PUZANOV, Mikhail Apollonovich, kand.tekhn.nauk; GORB, Matvey L'vovich, kand.tekhn.nauk; YANKEVICH, Vil'yam Fedoseyevich, inzh.; SINYAVSKAYA, Mariya Dmitriyevna, inzh.; VAL'CHUK, Georgiy Iosifovich, inzh.; KRAMAROV, V.S., prof., doktor tekhn.nauk, retsenzent; TYNYANYY, G.D., red.; GORNOSTAYPOL'SKAYA, M.S., tekhn.red.

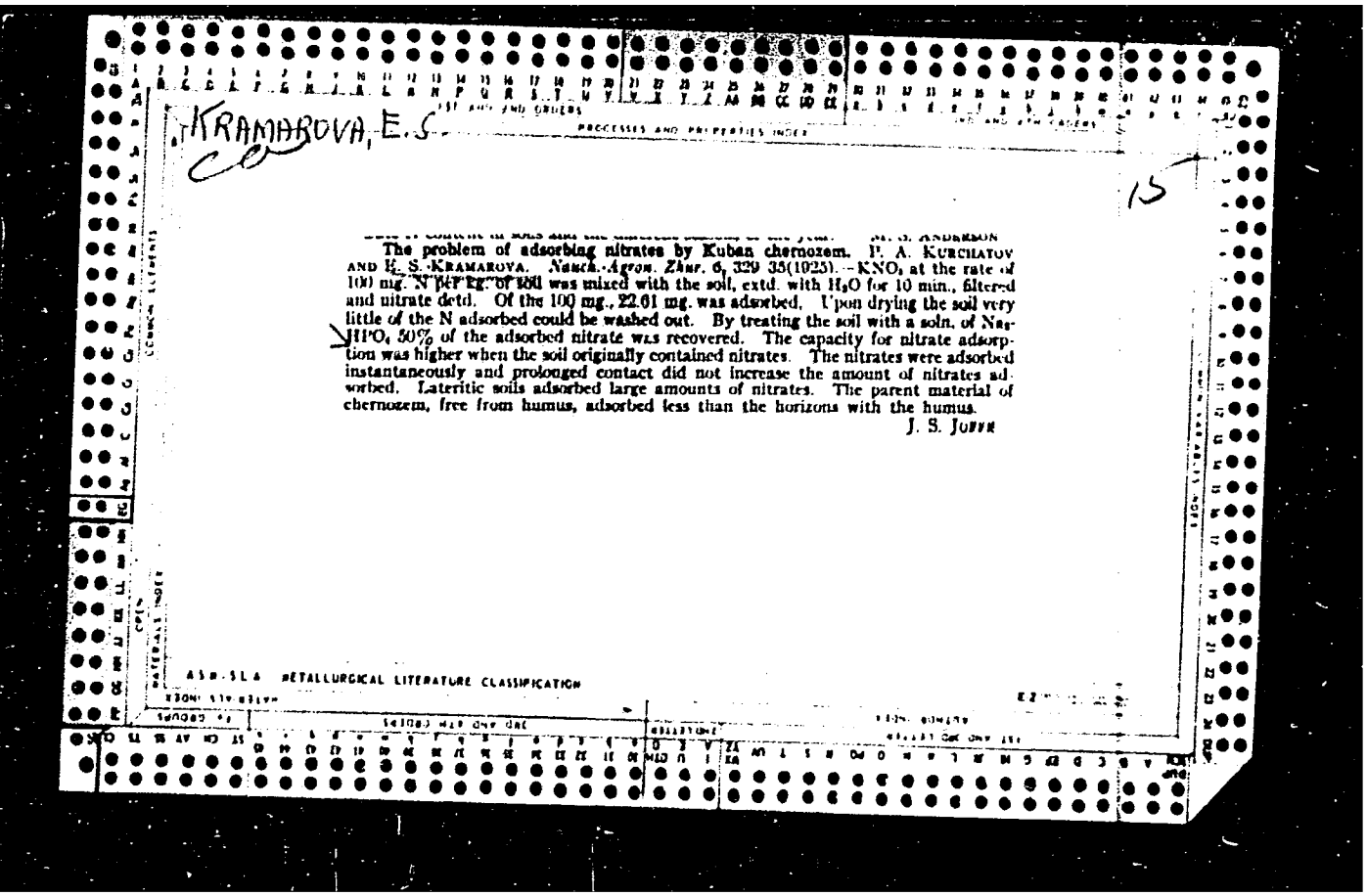
[Increasing operating safety of machine parts] Povyshenie ekspluatatsionnoi nadezhnosti detalei mashin. Moskva, Gos.nauchno-tekhn. izd-vo mashinostroit.lit-ry, 1960. 292 p. (MIRA 14:1)

1. Chlen-korrespondent AN USSR (for Grozin).
(Machinery) (Mechanical wear--Testing)

PERCHIKHIN, A.V.; KRAMAROV, Yu.I.

Shearing machine with a built-in electric motor. Zhivotnovodstvo 21 no.5:42 My '59. (MIRA 12:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektrifikatsii sel'skogo khozyaystva (VIESKh).
(Sheep shearing)



KRAMAROVA, E.S.

15

The problem of adsorbing nitrates by Kuban chernozem. P. A. KURCHATOV AND E. S. KRAMAROVA. *Nauch.-Agron. Zhur.* 6, 329-35(1925).—KNO_3 at the rate of 100 mg. N per kg. of soil was mixed with the soil, extd. with H_2O for 10 min., filtered and nitrate detd. Of the 100 mg., 22.61 mg. was adsorbed. Upon drying the soil very little of the N adsorbed could be washed out. By treating the soil with a soln. of Na_2HPO_4 50% of the adsorbed nitrate was recovered. The capacity for nitrate adsorption was higher when the soil originally contained nitrates. The nitrates were adsorbed instantaneously and prolonged contact did not increase the amount of nitrates adsorbed. Lateritic soils adsorbed large amounts of nitrates. The parent material of chernozem, free from humus, adsorbed less than the horizons with the humus.

J. S. JOFFE

KRAMAROVA, E. S.; KHLEBNIKOV, N. I.; PERTSOVSKAYA, M. I.; ALF, S.L.

"Sanitary Investigation of the Soil in Populated Regions," 133 pages, Moscow, 1951

L 16859-63 EWT(1)/EWP(q)/EPF(n)-2/EWT(m)/BDS/T-2/ES(s)-2 AFFTC/ASD/ESD-3/SSD Pu-4/Pt-4 GG/JD/WH

ACCESSION NR: AR3006315 S/0058/63/000/007/E051/E051

77

SOURCE: RZh. Fizika, Abs. 7E334

AUTHOR: Kramarova, L. P.

TITLE: Certain problems in the aging of ferroelectrics 21

CITED SOURCE: Sb. Materialy* 4-y nauchn. konferentsii aspirantov. Rostovsk. un-t. Rostov-na-Donu, 1962, 81-83

14 4

TOPIC TAGS: ferroelectrics, aging, dielectric constant

TRANSLATION: An investigation was made of the aging of the dielectric properties of barium titanate 27 ferroelectric ceramics. 17 It is shown that upon aging of $Ba(Ti, Sn)O_3$ crystals to which iron (<1%) has been added, the maximum of the dielectric constant $\epsilon(t)$ is not only decreased, but shifts toward the higher temperatures by 15--30°C. When the crystal and ceramic of $Ba(Ti, Sn)O_3$ without the ad-

Card 1/2

L 16859-63
ACCESSION NR: AR3006315

dition of iron are aged, or when the ceramic $Ba(Ti, Sn)O_3$ with iron addition is aged, no shift occurs in the maximum of $\varepsilon(t)$. The addition of Ca to the barium titinate ceramic greatly decreases the aging effect. It is shown that the action of a strong alternating electric field "rejuvenates" the ferroelectric ceramic less than the action of a high temperature. A plot is presented, showing that the dependence of ε on $\ln/\tau$ (τ -- time) is a broken line. N. Ivanov.

DATE ACQ: 15Aug63 SUB CODE: PH ENCL: 00

Card 2/2